RETURN

To an Address of THE HOUSE OF COMMONS, dated 13th April, 1870;—For Copies of all Reports made by the Engineers of the Public Works Department on their examination, so far as made last fall, of Dawson's proposed line of Canal or water communication through the North-West Territory.

By Command.

J. C. AIKINS,
Secretary of State.

DEPARTMENT OF THE SECRETARY OF STATE,
OTTAWA, 12th May, 1870.

DEPARTMENT OF PUBLIC WORKS,
OTTAWA, May 12th, 1870.

SIR,—I am directed by the Honorable the Minister to transmit the enclosed Copy of a Report made by one of the engineers of this Department, in connection with the opening of a line of communication between Lake Superior and Fort Garry, as called for by the Address herewith from the House of Commons, dated the 13th April, 1870.

I have the honor to be, Sir,

Your obedient Servant,
F. BRAUN,
Secretary.

E. Parent, Esq.,
Under Secretary of State for Canada,
Ottawa.

OTTAWA, 23rd March, 1870.

John Page, Esq., Chief Engineer,
Public Works.

SIR,—I have the honor to acknowledge receipt of your letter of the 13th August last, instructing me to make certain surveys and examinations of that part of the proposed route from Thunder Bay to Fort Garry, lying between the roads now in progress of construction, and which, it has been stated, can be made navigable by means of lock and dam, (for vessels drawing 5 feet water), for a distance of 311 miles.

By the terms of your letter, the number of persons to be employed in this duty was then limited to one surveying party.

This party was immediately organized, and the necessary instruments, tents, provisions &c., &c., having been rapidly secured, we proceeded to Collingwood, and left for Fort William, Lake Superior, by the steamer of the 18th August.

It will be advisable to prefix a brief notice of our movements, in order that you may perceive the length of time actually spent in making the surveys, as distinguished from that passed in the voyage to the field of operations, and in returning from thence.

We arrived at Fort William on the 21st of August, and, as soon as possible, Indians were engaged to man four canoes of sufficient size to carry the party, and provisions for about six week's work. This took some short time, but the men having been got together, and the canoes purchased at the Hudson Bay Company's Post, we started to ascend the Kaministiquia on the evening of the 24th August. We were obliged to adopt this route in consequence of being unable to get our provisions, &c., taken over the road then being constructed from the "Depot" to the mouth of the Matawin, the distance by the road from Thunder Bay to that point being a little over 20 miles, whilst by the river it is nearly 45 miles, in which a fall of about 350 feet had to be overcome.

After a tedious journey of three days, we arrived at the junction of the Matawin with the Kaministiquia, when, upon consulting with the native Indians, we found that it would be impossible to get up the Matawin, as the portages were not then cut out wide enough to let the large canoes pass. Accordingly, we had to push through by the old route, via Dog Lake and River, Savanne River, Lac des mille Lacs, and Kashaboine Lake to Shebandowan Lake, a further distance of over 100 miles (see Trace No. 11). We arrived at the latter place on the evening of the 4th of September, and after repairing the canoes &c., we moved on the 7th to a point about 3 miles above the outlet and commenced work, which was continued until the 20th of October, when the camps were struck, and the party returned to Thunder Bay, via the Matawin River and the new road.

It was not the intention to leave until about the 7th of November, as I understood that a special trip was to have been made about that time by the steamer "Chicora," so as to bring down a large number of men employed on the works. This arrangement was not carried out, but fortunately, it proved no cause of delay to us, as, towards the latter end of October, the ice had begun to form in the lakes and rivers, and in a few days after we left it would doubtless have been dangerous, if not impossible to descend with the canoes.

We arrived at Ottawa on the 6th November. From the above, it will be seen that out of 83 days, 40 were spent in travelling and unavoidable delays, leaving only 43 days (including Sundays), or 37 working days for actual field operations.

The weather was quite unfavorable whilst we were encamped upon Lake Shebandowan, with the exception of one week. This will be evident, from the subjoined meteorological register kept regularly every day during the period of the survey.

As it seemed quite apparent, from the lateness of the season, and the comparatively small force employed, that little more than a commencement could be made on a work of such extent as that entrusted to my charge, attention was first directed to the question of the practicability of raising Shebandowan Lake to the level of Kashaboine, as proposed, and making their united waters the summit level of the contemplated navigable route, or, in the event of this appearing impracticable, to endeavour to obtain such information as might enable the rough outline of an alternative scheme to be submitted for your consideration. At first glance it seemed a very formidable undertaking to attempt to raise a lake of such dimensions to a height of thirty feet above its natural level. The following opinion is, however, expressed on this project in page 9 of Mr. Simon J. Dawson's Report of 1869 :—

"It is quite practicable to bring either Lac des Mille Lacs, or Shebandowan Lake, "or both of them, to the level of Kashaboine Lake, but there would be an evident "advantage in raising Shebandowan Lake, and making it the summit level and source of "supply, as a considerable amount of lockage would thereby be saved, and the road from "Lake Superior would at once strike the highest level on the whole route."

At page 18 of the same Report, mention is made of the dam proposed to effect this, which is estimated by Mr. Dawson at a probable cost of $12,000. It is also stated, that "material for the work is in unlimited abundance."

As the area of the lake to be raised was not even approximately known, it became necessary to determine this with tolerable accuracy, and, accordingly, a trigonometrical survey was carried from a base line measured near the outlet to the western extremity, a distance of about 29 miles. The results of this survey are shown in detail in the large map marked No. 1.

The shores of Shebandowan Lake were examined as thoroughly as time would permit, and several of the tributaries roughly surveyed. Their levels were, however, accurately determined with reference to the surface of the main reservoir; so that a fair idea was obtained of the area likely to be overflowed by raising the water 30 feet, as proposed. This area is shown on the accompanying topographical map, marked No. 2.

The Matawin River was surveyed down to the first Chûte, and the traverses connected with the lake triangulation. See plan, No. 3.

Lines of levels were run from Shebandowan Lake to the site chosen by Mr. Dawson, for the Matawin Dam, and the ground in that vicinity carefully examined and cross-sectioned. See profile, No. 4, and plan, No. 5.

With a view of measuring approximately the discharge by the Matawin (the only natural outlet of the Lake) accurate sections were taken at three points considered suitable for that purpose. The calculations are shewn in profile marked No. 6.

The above data are considered sufficient to enable a reliable opinion to be formed on the question of the practicability of raising Shebandowan Lake 30 feet, but before entering into details, it is considered proper to give a general idea of the character of the summit region.

The surface of the country is very rugged, rocks, lakes, and swamps alternate in rapid succession, and the proportion of water to land is unusually great. In the valleys, between the knolls of the Laurentian or Huronian formation, there are almost innumerable sheets of water, irregular in outline, generally deep, and, although sometimes quite large, often discharging by a comparatively small and feeble outlet.

Well defined ridges or shores are few, the country being broken up into hills from 50 to 200 feet high. The rocks are generally bare on the summits, on the sides and in the valleys there is a growth of birch, poplar and evergreens, chiefly spruce, balsam, or pitch pine, and in some places there are patches of red or white pine of moderate size. The country has, however, been so frequently swept by fire that the larger growth is now rare.

In many parts the burnt and fallen trees are so thick as to form a sort of net work over the surface of the ground, and often lying across the creeks, render it very difficult to get through even with small canoes.

The name "Shebandowan Lake" is applied to what are in reality three deep and comparatively narrow lakes lying in the hollows of the rocks, and communicating with each other by lateral channels; that is to say, they do not form a chain in the usual way of lakes lying in the same valley, where the inlets and discharges are generally at the opposite ends, but they overlap each other and communicate through openings in their sides as will readily be seen on reference to plan No. 2.

The southern shore is, for the most part, bold, but at the head of the Lake there is a very large area of swamp, and a considerable extent of the north shore is low and marshy.

The lakes have an aggregate length of 31½ miles, and receive the discharge of the Kashaboine and its tributaries, on the northern side, at about 8½ miles from the western end. This stream, and another near the eastern extremity of the lake, are the largest flowing into it.

Shebandowan (exclusive of its numerous islands) contains 25 square miles, the additional area which would be submerged, were its surface 30 feet higher would be more than three times the area of the lake itself, or say 85 square miles. This would be made up of the large swamps along its borders, together with several of the tributary streams and small lakes now discharging into it, some of which are on the same level as the main reservoir whilst others are from 12 to 18 feet above it. There may be other lakes of this sort yet undiscovered, but it is believed the whole area connected with Shebandowan, and embraced by a contour line of thirty feet over its present surface, would not be less than 110 *square miles.*

It may here be remarked that in a summit region such as this, any interference with the normal levels of the lakes would be attended with more than ordinary risk of overflow, as many of them of them lie so nearly on the same plain. In the valley of a great river

system, the question of raising the surface is merely one of a structural kind, as there is no doubt as to what direction the water will in such a case ultimately take, if dammed within reasonable limits. On referring to Plan No. 2, it will, however, be seen that if the level of Lake No. 2 which now flows to the westward were raised 30 feet by a dam at C, its waters would find an outlet in a contrary direction, and it is quite possible that at some of the remote tributaries of Shebandowan a similar occurance might take place, were an attempt made to raise its surface 30 feet, that is to say, although much care was taken to determine whether there would be an overflow into another system at that level, the character of the country is such that no definite conclusion could be arrived at on this point, in the limited time at our disposal.

But, without taking this possibility into consideration, the question arises as to whether the natural flow out of the lake would, even if it were possible to wholly arrest and back it over the area to be submerged, fill the reservoir within a reasonable length of time.

The only natural discharge is the River Matawin, and we, therefore, endeavoured to get at the mean quantity passing through this channel during a dry season, as, of course this would be all that could be judiciously reckoned upon.

At the place selected for the measurement, the river was nearly 200 feet wide, with between 9 and 10 feet water at the deepest part, The sections were taken at right angles to the stream and 100 feet apart, the area of outflow was found to be very similar at all the three places, the current being also about uniform. There was considerable difficulty however, in arriving at a fair idea of the quantity, as the bed of the river was strewn with boulders (many of them of considerable size), the obstruction caused by which, it was obviously impossible to correctly estimate.

It was stated by the Indians that the water was unusually high at the time, probably a foot and a half or two feet over its ordinary level in the fall. This view seemed reasonable, as the season was a remarkably wet one, and Lake Superior itself is said to have stood fully a foot higher than at the same date in 1868.

Taking all the circumstances of the case into consideration, it appears that not more than say 700 cubic feet per second could be estimated as the mean discharge throughout a dry year.

Were this entirely thrown back over the area of 110 square miles above referred to, it would take from 3 to 4 years to fill the lake, and the adjoining areas to be submerged.

Of course, no such result could reasonably be expected, inasmuch as there would be various causes to operate against it, the principal being :—

1. Loss by evaporation from increased area of water surface.
2. Loss by infiltration.
3. Leakage at the proposed dam.

1. The amount of loss by evaporation from water surface varies so considerably under the different conditions of climate, the character of the soils, &c., that even where these are well known, it is found difficult, if not impossible, to correctly estimate it. Some authorities assert that it frequently exceeds the rainfall, whilst others maintain that it does not amount to one half of the total precipitation. However this may be, all are agreed that evaporation from water surface greatly exceeds that from the land; and it is therefore obvious that by exposing say 110 square miles, instead of about 30, to its action (the area of drainage being the same in both cases), a serious loss would arise from this cause.

2. It is quite evident upon examination of this locality, that as the rocks of the Laurentian or Huronian formations are tilted up so that the strata are in many places nearly vertical and full of fissures, the water would find innumerable outlets, and in this way (if in no other) probably pass into different systems. At all events, it appears that a very large deduction would have to be made for loss from this cause.

3. As to the question of leakage at the dam, which it has been proposed to build, it may be safely said, that if a structure of moderate dimensions were built on the slate foundation at the site chosen, the water would escape through the numerous fissures in

the rock, and render it impossible to make the structure tight. In order, however, to raise the surface of Shebandowan Lake 30 feet over its present level, the river would have to be elevated about 49 feet at the head of the first chûte, and the dams to effect this, would have to be about half a mile long, and in some places over sixty feet high. It is obvious that the mass of materials required for such a work would be enormous, whilst the great pressure to which both the dam and its foundations would be subjected, prevents a reasonable expectation of its being made to retain anything like the volume now passing in the river, even were the most expensive mode of construction adopted. The plan marked No. 5, shews the area of cross section which would have to be dammed, were this site approved.

The surveys of the Matawin, shew that, at a point about a mile higher up the stream, the banks approach each other so much closer, that a dam, having the same object in view, would not require to be over a thousand feet in length, and (as the river falls very rapidly) about forty-five feet high in the central portion.

If, however, a dam were built at either of these places, and made as nearly water-tight as circumstances would permit, it does not appear that the lake or reservoir would fill within a reasonable period. That is to say, an attempt to raise its surface thirty feet by means of a dam across its present outlet, would, in all all probability, prove a failure.

Moreover, it appears injudicious to depend upon structures of such magnitude, and in such positions, for the maintenance of what is intended as a leading line of communication; as were they to fail (especially during the season of navigation) the traffic would be stopped for a very long period, during which no alternative means of transport could be resorted to.

As it seemed doubtful, after a cursory examination of the locality, whether this part of the route could be secured as proposed, attention was given (whilst the triangulation was in progress) to a thorough survey of the Kashaboine River, with a view of obtaining such information as would enable you to form an opinion as to whether it would be advisable to lock up from Shebandowan Lake to Kashaboine, and make the latter the summit, or by some modification of this idea to arrive at an alternate scheme.

The topography of the river banks has been carefully sketched, and numerous levels and cross sections taken, so as to accurately shew the shape of the ground. The outflow was also measured in a similar manner to that of the Matawin.

The results of these operations are shewn on plan No. 7, and profiles No. 8 (trace) and No. 9. As will be seen, on reference to these documents, the river consists of a series of rapids and pools, and is extremely tortuous on its course between the lakes, in which distance (about a mile) it falls 2,933 feet over an irregular rocky bed, and with a depth of water varying from 2 to 20 feet.

These lakes (Shebandowan and Kashaboine) might be connected by a channel nearly straight, as shewn on trace No. 8, in red. This would reduce the distance to about 3,800 feet, and the work does not appear to be very formidable.

Should this plan be considered advisable, Lake Shebandowan might be raised 4 or 5 feet, by means of a dam placed at B in the Matawin. (See plan No. 2). This would reduce the lockage up to about 25 feet, and would secure good water at the mouth of the river, which is at present much obstructed by large boulders. It would also have the effect of giving a greater depth in the narrow channel of communication between the upper and lower lakes, which we found to be only from 60 to 80 feet wide, with barely 5 feet 6 inches water in the shallowest part. The rapid at this point would probably be diminished, and ample water afforded at one or two places where increased depth is required.

There seems to be a sufficient volume of water passing through the Kashaboine outlet for lockage both ways, as the flow was estimated at nearly 600 cubic feet per second. If only two-thirds of this amount were to pass during a dry season, and of that only a little over one-half were available, there would be enough for the probable lockages both into Shebandowan and Lac des Mille Lacs. Besides the level of Kashaboine might

be kept up so as secure the accumulation caused by the melting of the snows in spring, for the supply during the dry season.

It may here be remarked, that from all we could learn, the levels of the lakes in this region, are subject to comparatively little fluctuation. This seems to be reasonable, as from the large proportion of water to land, the area drained by the greater number of them must be small; and although in such a steep and rocky country, it is probable that the rain fall, soon finds its way into the lesser reservoirs, yet the rise in them is never considerable, whilst the creeks by which they discharge, being generally obstructed by fallen trees, the water is held back and the flow is equalized, so that even in the lakes, which have numerous tributaries, no great variations take place. When we were at Shebandowan, the surface stood about one foot below what (judging from the shores) appeared to be high water mark, whilst the Indians assured us that eighteen inches to two feet below the then level would be about lowest water. Thus it would appear that the extreme fluctuation would not be over three feet—perhaps a little less, In this view of the case, it is considered that the supply above calculated for dry seasons from Kashaboine Lake, might be reckoned upon with tolerable certainty; but, of course, further experience would be necessary before any positive statement could be made on this subject.

There is, however, an alternative scheme shewn on the plan, marked No. 7, which, if thought practicable, would place the question of supply beyond reasonable doubt. This is to lower the level of Kashaboine Lake 4 or 5 feet and raise Lac des Mille Lacs to this plane. As it is already proposed in any case to raise the latter 3 or 4 feet "in order to give a sufficiency of water in the direction of Baril Lake and the French Portage," (See Dawson's Report of 1869, page 9), it may be found, on further examination, that this would be the best course, as although it would involve more excavation, &c., both at Kashaboine and the summit pond, and cutting, yet it would save 8 or 10 feet of lockage, and, by making the united waters of Lac des Mille Lacs and Kashaboine the summit and source of supply, afford ample water the whole route. This project is shewn on profile No. 10.

Of course, these propositions are submitted merely for the purpose of shewing that although it is believed to be impracticable to raise Shebandowan Lake, as proposed, there are other modes by which this part of the line could be rendered navigable.

As before stated, large growth pine is rare; but it is believed that all likely to be required for works in the vicinity could be easily obtained.

There is no limestone nearer than Thunder Bay, where, Sir Wm. Logan states, there are beds which, if burnt, would make good lime for building purposes.

We found no clay either on the shores of Lake Shebandowan, or in the valley of Matawin River, as far down as we surveyed it. There are banks, bluffs, and spits of gravel, but no argillaceous deposits of any kind.

The rocks of the Laurentian formation lie (where stratified) nearly on edge; the strata are very tortuous, and, doubtless, would be hard to blast, whilst they could not be worked into stone for building purposes, except at considerable expense.

It is presumed that any hydraulic cement required, will have to be brought from Canada.

Stone can be had on the shores and in the bed of the river, to fill the cribs for the dam proposed at B on the Matawin. See plan No. 2.

From the foregoing Report, and the accompanying plans, it will be seen that barely one-twelfth of the proposed line of navigation was examined last fall, although every exertion was made to push the work as rapidly as possible.

It is true that the expedition in starting, and the distance from Ottawa to the field of operations being so great, much time was consumed in going and returning, so that as before stated, only *thirty-seven days* were actually available for work.

The surveys of other parts of the line may not require to be so accurate as that of Lake Shebandowan, and would therefore occupy less time for a similar length of route; yet, as the interior is approached, the difficulty of transporting the necessary provisions must increase, and in consequence the operations become more costly.

I enclose herewith a copy of a letter, dated the 23rd of August, handed me at Fort William by the Hon. Minister of Public Works, instructing me to take Mr. McLaughlin, photographer, for the purpose of making views of the interior of the country. His expenses have been kept separate as directed.

Lists are subjoined of the instruments, tents, canoes, and surplus stock of provisions stored either at the Matawin Station, Fort William, or the "Depot," at Thunder Bay.

I am happy to be able to state that my assistants proved both energetic and competent. The triangulation of the Shebandowan Lake was done by Messrs. Rowan and Bell, and the various levels were carefully taken by Mr. George Lindsay.

We suffered no annoyance from the few native Indians which we met with, who, on the contrary, proved to be quite friendly.

Trusting that our work will be found satisfactory.

I have the honor to be, Sir,

Your obedient Servant,

THOMAS MUNRO,
Engineer in charge of Surveys.

LISTS OF PLANS HANDED IN HEREWITH.

No. 1.—Large map, shewing triangulation of Shebandowan Lake.
2.—Topographical map of Shebandowan Lake and vicinity.
3.—Plan of the Matawin River.
4.—Profiles of Matawin River and bank.
5.—Plan and cross-section at First Chûte, Matawin River.
6.—Measurements and sections of discharge, Matawin River.
7.—Outlet of Kashaboine Lake, sections &c., &c.
8.—Trace of Kashaboine Lake, shewing alternative scheme.
9.—Profile of Kashaboine River and banks.
10.—Approximate profile across the summit.
11.—Trace shewing route followed in reaching Shebandowan Lake.

One trace copy of all these plans, except No. 8 and 11.

T. M.

METEOROLOGICAL Register, Shebandowan Lake (about 1,500 feet above the sea.)

Date.	Barometer.		Thermometer.				Wind.		Remarks.
	7 a.m.	7 p.m.	7 a.m.	7 p.m.	max.	min.			
1869.									
September:—									
9 Thursday..	28·28	28·20	54	58	73	52	W. & by N.	fresh	Very little cloud.
10 Friday	28·06	28·00	60	58	71	44	S.	strong	Thunder in the afternoon, and heavy rain about 5 p.m.
11 Saturday ..	28·07	28·18	48	58	67	43	W. & by S.	fresh	Wind very strong for a short time in afternoon.
12 Sunday	28·22	28·14	52	49	57	50	E.	slight	Blew a little in morning, raining on and off all day.
13 Monday....	28·24	28·35	49	49	55	48	N.E.	fresh	Rained all day, very heavy at times, blowing hard in evening.
14 Tuesday ..	28·32	28·28	54	60	62	51	E.	fresh	Thick fog in morning, cloudy all day, rain at 7 p.m.
15 Wednesday	28·08	27·94	57	54	63	52	E. & by N.	fresh	Thick fog in morning, showers during day, wind S.E. in even.
16 Thursday .	27·78	27·86	52	52	63	51	S.W. by W.	fresh	Rained hard all morning, showery in afternoon.
17 Friday	27·92	28·06	44	53	63	43	S.W.	slight	Fog in morning, showers in the day.
18 Saturday ..	28·04	28·18	55	64	76	51	E.	slight	Some slight showers.
19 Sunday....	28·27	28·23	68	69	76	58	S.	strong	Cloudy in morning, but bright in afternoon, wind fell.
20 Monday...	28·32	28·32	59	56	64	58	S.W.	very strong	Cloudy in morning, clear in even.
21 Tuesday ..	28·38	28·30	50	59	66	46	S.W.	strong	Day fine, but threatening towards evening.
22 Wednesday	28·26	28·32	52	62	72	45	S.W.	slight	Day fine, evening cloudy.
23 Thursday..	28·18	28·06	57	62	64	52	S.E.	fresh	Fine in morning, rain in afternoon, heavy in evening, thunder and lightning.
24 Friday	27·95	28·14	59	46	62	57	S.W.	strong	Heavy rain all night and till noon, afternoon showery.
25 Saturday..	28·32	28·41	32	37	45	29	N.W.	fresh	Sharp frost last night, some flurries of snow, day cold.
26 Sunday....	28·44	28·40	38	34	46	36	N.W.	fresh	Flurries of snow off and on all day.
27 Monday...	28·34	28·14	32	43	50	23	S.W.	slight	Very fine day.
28 Tuesday...	28·00	28·16	41	45	64	34	W.	slight	Day very fine, hardly any wind, warm.
29 Wednesday	28·10	27·96	39	55	70	34	S.W.	fresh	Day fine, squally in afternoon.
30 Thursday..	28·02	28·10	55	64	66	47	S.W.	fresh	Heavy squalls in afternoon, day fine.
October:—									
1 Friday	28·00	27·86	56	46	67	54	S.E.	fresh	Rained very heavy in evening, wind changed to W. and blew a gale.
2 Saturday ..	28·00	28·08	42	49	60	36	W.	strong	Very high wind all day, with snow storms.
3 Sunday....	28·10	28·28	40	48	60	38	W.	strong	Very wet all forenoon, afternoon fair, blowing a gale.
4 Monday...	28·32	28·32	36	40	54	29	N.W.	fresh	Flurries of snow in forenoon, afternoon very fine.
5 Tuesday ..	28·28	28·08	35	52	55	29	S.W.	fresh	Day fine, wind changed to east towards evening.
6 Wednesday	27·90	27·94	41	50	64	40	E.	calm	Beautiful day, calm till 4½ p.m., then blew strong.
7 Thursday..	27·92	28·04	42	55	62	41	E.	calm	Calm, all day dull, blowing fresh after sundown.
8 Friday	28·05	28·00	49	53	56	46	E.	strong	Wet, foggy in morning, heavy rain with vivid lightning before noon, rained all day.
9 Saturday ..	27·62	27·68	49	35	50	47	S.W.	gale	Wind E. in morning, rain, snow, sleet, all day, heavy gale in even.
10 Sunday....	27·66	27·92	34	37	45	32	S.W.	gale	Snowing off and on all day, heavy gale.

METEOROLOGICAL Register.—*Continued.*

Date.	Barometer.		Thermometer.				Wind.		Remarks.
	7 a.m.	7 p.m.	7 a.m.	7 p.m.	7 a.m.	7 p.m.			
11 Monday...	27·88	28·02	33	33	44	32	N.W.	gale	Snowing off and on all day, heavy gale.
12 Tuesday...	27·80	28·11	26	33	40	26	N.W.	strong	Snowing off and on all day, wind moderate in afternoon.
13 Wednesday	27·80	27·78	26	29	38	22	E.	strong	Very cold, snowing hard all afternoon and evening.
14 Thursday..	28·01	28·14	26	30	40	21	N.W.	strong	Morning cloudy, showers of snow in afternoon.
15 Friday	28·11	27·93	26	35	37	22	S.W.	fresh	Day fine, but cold, with showers of snow.
16 Saturday ..	27·75	27·98	31	31	44	31	S.W.	strong	Fine in morning, afternoon squalls and heavy fall of snow.
17 Sunday....	28·14	28·22	25	22	38	23	N.W.	strong	Wind at times very strong, occasional heavy snow storm.
18 Monday...	28·22	28·30	22	25	28	21	N.W.	fresh	Dull day, a little snow, very cold.
19 Tuesday...	28·30	28·04	19	28	42	18	N.W.	fresh	Snow in morning, day beautiful, bright, and fine.
20 Wednesday	27·66	27·58	32	30	39	27	W.	strong	Heavy gale all night, to-day, till evening, heavy snow.
21 Thursday...	27·70	.....	29	.....	.....	28	.....	.....	Storm in afternoon.